Training Manual for State Environmental Code 1995
Chapter Five

INSTALLATION, REPAIR AND MAINTENANCE

This is a session on the investigation and licensing of persons who install and repair on-site sewage treatment and disposal systems and those persons who pump septage from such systems. The session is devoted to the inspection process and includes the inspection of the contractor's equipment, components of an on-site sewage treatment and disposal system, fill, stone and other supplies, as well as a check list for the inspection.

The session will include classroom discussions with field inspections and/or audio-visual materials.

SUGGESTED READING ASSIGNMENTS:

Title 5: Standard Requirements For The Siting, Construction, Inspection, Upgrade, and Expansion of On-Site Sewage Treatment and Disposal Systems and the Transport and Disposal of Septage (see Subparts A and D).

What You Should Know in Order to Identify and Maintain Your Sewage System, DEP, 1 Winter St., Boston, MA 02108

State of the Art Manual of On-Site Wastewater Management, National Environmental Health Association (see Chap. 8, 9, 12)

SESSION OBJECTIVES:

By the end of the session, the trainee will be able to:

(A) Understand the responsibilities involved in the licensing of contractors for the installation, pumping, repair and maintenance of on-site sewage treatment and disposal systems,

(B) Conduct an inspection of an on-site sewage treatment and disposal system and ensure that the system meets the provisions of Title 5, and

(C) Determine the appropriateness of a contractor's materials to meet the specifications of Title 5 and of his equipment to do the job intended.

CONTRACTORS, LICENSING

The board of health and the design engineer usually spend a considerable amount of time conducting or overseeing soil and site investigations, percolation tests, deep observation hole examinations and detailed plan review for a proposed on-site sewage treatment and disposal system on a lot. However, all this time and effort will be fruitless if the system is not properly installed. Therefore, it behooves the board of health to ensure that, before issuing a Disposal System Installer's Permit, the contractor meets the following criteria:

(a) is an experienced on-site sewage treatment and disposal system contractor who has a working knowledge of the purpose and intent of the contents of Title 5 and any local regulations for the treatment and disposal of sewage,

(b) is capable of understanding the function of all system components,

(c) is reliable in reading and implementing a design plan, and

(d) owns, or has access to, appropriate and properly operating equipment to install on-site sewage treatment and disposal systems.

Title 5 provides that the board of health issue a Disposal System Installer's Permit to persons and firms intending to engage in construction, upgrade, alteration or repair of an individual sewage treatment and disposal system and that none of these activities shall occur without such permit. The Disposal System Installer's Permit can be issued for a period not to exceed two years and may be revoked by the board of health, for cause.

Since the board of health has the final responsibility for ensuring that a on-site sewage treatment and disposal system is installed in accordance with the design plan and meets with the provisions of Title 5, the board should know that its task will be extremely difficult if the contractor is deficient in the above criteria. Therefore, it is recommended that no permit be issued until the board has satisfied itself that neither applicant nor equipment is lacking. Furthermore, the board should not hesitate to revoke a Disposal System Installer's Permit, for cause, if the permit holder proves to be inadequate for the task.

The board of health is also authorized to issue a Septage Handler's Permit to persons and firms engaged in the pumping or transport of the contents of any part of an individual on-site sewage treatment or disposal system. Such permits are issued under M.G.L. Chapter lll, Section 3lA, however, the transportation and disposal of septage is further regulated under Title 5 (Subpart F). Boards of health should pay particular attention to the Title 5 provisions relating to disposal methods and sites, including the need for approval by the Department of Environmental Protection, and to the matter of equipment to be used by the septage handler.

SYSTEM COMPONENTS, SUPPLIES, EQUIPMENT

Boards of health should become familiar with the various kinds of sewage disposal system components and supplies that are available and being used in the area. Concrete, fiber glass, and plastic units should be evaluated to determine their advantages and disadvantages. The products of specific manufacturers should be examined to determine if they meet the specifications stated in Title 5. File records of these products should be retained by the board of health for future reference.

The stone to be used in the construction of all soil absorption systems including trenches, pits, galleries, chambers, and fields should consist of washed stone, free of iron, fines and dust, and should measure from 3/4 to l-l/2 inches in size, except for the 2 inch top cover layer which shall measure l/8 to l/2 inches in size. All stone should have less than 0.2 percent material finer than a number 200 sieve as determined by the AASHO Test Methods T-ll and T-27 (latest edition). If in doubt about the size of the stone delivered, or the presence of iron, fines or dust, the board of health may require that the stone be submitted to a sieve test.

Heavy equipment, used by disposal works installers and septage handlers, should be operated in a manner that will not disrupt or damage an existing treatment or disposal system or one that is partially constructed.

Repairs and upgrades to an existing system are required to be made in compliance with the regulations of Title 5 to the maximum extent feasible, and may require a variance granted by the board of health under the procedures and provisions of Subpart F of the revised code. Every part in an existing system is not necessarily required to be replaced and brought up to present standards, by most boards of health, when repairs are being made. Instead, the deficient part, or that part which appears to be at fault, is replaced or enlarged in accordance with the provisions of Title 5.

Colored dyes can be used to locate the source of a sewage outfall onto the ground or into a lake or stream when the outfall is some distance from the defective system, or if it is difficult to determine the source from among two to several properties. Care should be taken to avoid using dyes where private wells are used for drinking water. Several colors may be used when testing a number of homes as long as a blend of two colors is not confused with a third color.

Boards of health should disseminate information to residents of the community regarding the care and maintenance of on-site sewage disposal systems. Flyers and pamphlets giving instructions to homeowners are available from DEP in the Boston and regional offices. Title 5 does not set a specific timetable for the pumping of septic tanks, however, a schedule of pumping a minimum of once every three years is recommended. Pumping every year is expensive and probably not necessary. Schedules of longer than every three years are likely to be forgotten.

INSPECTION

The board of health has lawful authority to grant permits for the installation and construction of on-site sewage treatment and disposal facilities and the responsibility for issuing a "Certificate of Compliance" indicating that the sewage treatment and disposal system has been located,

constructed, altered, or repaired in compliance with the terms of the permit and the requirements of Title 5 and any appropriate local rules and regulations.

It is helpful to conduct a pre construction conference with the appropriate persons to determine that all information has been received and to go over the inspection process. The meeting should involve the designer, installer, and board of health representative. There should be three copies of the approved plan to insure that the current design is the one being installed. One of the approved plans should be on site at all times. Before the installation should begin, a bench mark should be established in a permanent location by the engineer/sanitarian. The system location should be staked and checked to confirm the correct area. If variances are required, they should be obtained as well as operation and maintenance plans.

The board shall require inspection of all construction by the designer or by an agent of the board and require such designer, or agent of the board, to certify in writing that all work has been completed in accordance with the terms of the permit and the approved plans. The signed certification statement by the designer, or agent of the board, must be accompanied by an "as built" plan showing the locations of all components of the sewage system with the "tie-ins" to the building foundations to locate cover openings of the septic tank, distribution box, leaching pit, grease trap, pump or any other openings intended for inspection and cleaning out. The plan must also show water lines, wells, finished grade and any important changes from the original approved plan.

It is not practical for a board of health to have its agent view every stage of construction of all sewage disposal systems, particularly in those cities and towns undergoing considerable new development. Some boards of health have chosen to have designers inspect and certify compliance on most or all of the construction on sewage disposal systems, rather than commit the time of an agent of the board to this frequent and lengthy task. For those boards of health who elect to have the agent of the board inspect and certify compliance, it is necessary to establish some guidelines as to points of inspection on sewage disposal facility construction to protect both the board and its agent. The board cannot afford to commit the agent to be present during all stages of construction on all jobs and the agent, since it is his/her signature on the certification document, must have ample time to view important stages of the construction and installation.

Some suggested points where an inspection will be required are listed below. Two or more of the inspection points may be viewed on the same visit. These are as follows:

(a) Installation of the septic tank with connection to the house sewer and manholes open,

(b) Installation of the distribution box(es) with connection to the septic tank, top open and distribution lines in place,

(c) Excavation for the leaching facility, with and without stone,

(d) Completion of the leaching pit, trenches, field, chambers or galleries with stone in place, but distribution pipes uncovered and manholes open.

Two inspections may suffice for some installations while others with problems due to ground water, bedrock, or fill may require several visits to ensure compliance with Title 5. Also, in the case of a new contractor, or when working with a difficult contractor, multiple visits may be warranted. Usually, boards of health will rapidly learn the habits of those contractors who are likely to "cut corners" on construction jobs (for example, the contractor who will backfill a portion of the job, where compliance is doubtful, and then notify the board that the job is ready for inspection).

Additional guidance on how to conduct inspections, inspection checklist forms including a failure criteria checklist, and a certification of inspection form are provided in appendix 16 of this manual.

Title 5 authorizes the board of health to require modifications to an on-site sewage treatment and disposal system, at any stage of its construction, if conditions are encountered that were not originally observed.

Once the inspections have been completed and approved, an “As built plan” is submitted by the designer. This plan should reflect the actual location of the entire system including a permanent bench mark. When the board of health, after receiving certification documentation from the designer and agent of the board, is satisfied that a sewage treatment and disposal system has been constructed in accordance with Title 5 of the State Environmental Code, any applicable board of health regulations and as described in the application for a Disposal System Construction Permit, the board issues a "Certificate of Compliance." The certificate is first signed by the installer and designer and a copy goes to the Building Inspector.

Additional Inspections Required by Title 5

Title 5 now mandates that system inspections be conducted at or within nine months prior to the time of transfer of title to the facility served by the system unless weather precludes inspection, in which case the system must be inspected as soon as possible but no later than six months after transfer. Systems must also be inspected upon any change in use or expansion of use of the facility, for which change or expansion a building permit or occupancy permit from the local building inspector is required. Existing systems with design flows in excess of 10,000 gallons per day at full build out must be inspected by January 1, 1996 and at least once every three years thereafter. Shared systems must be inspected annually. The local Board of Health and/or DEP may also order the owner to have the system inspected when deemed necessary.

SYSTEM INSPECTORS

The code requires all inspectors to be approved by DEP. System inspectors who perform these duties may be a Massachusetts Registered Professional Engineer with a concentration in civil, sanitary, or environmental engineering, a MA Registered Sanitarian, or a Certified Health Officer. Additional individuals who may become approved inspectors after completing a course offered by DEP and passing an exam include:

* Board of Health members or agents
* Engineers in Training (EIT certified)
* Professional home inspectors
* Licensed Septage Haulers or system installers
* or other individuals with a minimum of one year demonstrated experience in septic system inspection.

DEP will maintain a list of all approved system inspectors that will be available upon request.

LOCAL UPGRADE APPROVALS

Sections 15.402 through 15.405 of the code set forth the procedures and criteria for local upgrade approvals. Local upgrade approvals may be granted by the local Board of Health without review by DEP for failed or non-conforming systems with design flows below 10,000 gallons per day if in compliance with the terms and conditions of those sections. Proposals for new construction or for increase in flow to an existing system are not considered upgrades and must comply with the requirements of the code or obtain a variance through the variance procedures. Local upgrade approvals **cannot** be granted for the addition of flows to a cesspool or privy or the addition of flows above the existing approved capacity.

Upgrades are required when one or more of the following occurs:

1. There is a backup of sewage,
2. There is a discharge of effluent to the ground surface or surface water,
3. A high liquid level exists in the distribution box above the outlet tee invert,
4. A system must be pumped four or more times per year, or
5. When a metal septic tank is found.

For cesspools, privies, or soil absorption systems, upgrades are required when the component is found:

1. In the groundwater,
2. Within 50 feet of a surface water,
3. Within 100 feet of reservoirs or tributaries to reservoirs,
4. Within a zone I of a public water supply wellhead,
5. Within 50 feet of a private well, or between 50 feet and 100 feet from a private well unless testing of the well demonstrates that the water is safe.
6. Within 50 feet of a wetland or saltmarsh

All upgrades must have a goal of full compliance. When full compliance is not feasible the code requires "maximum feasible compliance" (MFC) with the code requirements. The code also specifies an upgrade preference order that must be considered. Considerations include a variety of

items ranging from property line setbacks to reduction in the four foot separation with many considerations in between. The reader should consult section 15.405 for the preference order.

In all upgrades the applicant is required to notify affected abutters by certified mail more than 10 days prior to the board of health meeting when the project will be discussed. All systems requiring upgrades must complete those upgrades within one year of discovery unless a shorter time is mandated by the board of health or DEP because the system is deemed an imminent hazard to public health. Longer times up to a maximum of 5 years are allowed only through an enforceable schedule and for good cause.